Terrestrial Animal Health Standards Commission

September 2012 Report

USA Comments – recommended changes shown in blue font

DRAFT CHAPTER 7.X.

ANIMAL WELFARE AND BROILER CHICKEN PRODUCTION SYSTEMS

Article 7.X.1.

General comment: In various sections of the document, the United States provided outcome-based alternatives to a proposed recommendation. This is in keeping with Code Chapter 7.1, Article 7.1.2 – Guiding Principles for Animal Welfare. The inclusion of prescriptive or design-based standards into any of the animal welfare code chapters is restrictive and limits other available and feasible options to attain the same outcome.

Definitions

For the purpose of this chapter:

Broiler
means a birds of the species *Gallus gallus* ~~kept~~ raised ~~primarily~~ for commercial meat production. Poultry kept in village or backyard flocks are not included.

Harvesting
means the catching and loading of birds on farm for transportation to the *slaughterhouse/abattoir.*

~~***Slatted floor***~~
~~means a housing system where the broilers are kept on raised floors, on which droppings do not accumulate, but they fall through.~~

~~***Backyard flocks***~~
~~means village or backyard production with minimal biosecurity and birds/products consumed locally.~~

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means village or backyard production with minimal biosecurity and birds/products consumed locally.

Rationale: Recommend keeping the definition of 'backyard flocks' as the term is used in the definition of "Broiler" and continued inclusion may be warranted for clarity.

Article 7.X.2.

Scope

These recommendations cover the production period from arrival of the chicks on the farm to harvesting the broilers in commercial production systems. Such systems involve confinement of the birds, the application

of biosecurity measures, and trade, regardless of scale, in the products of those birds. These recommendations cover ~~systems include~~ broilers kept in cages, on slatted floors, litter or dirt and indoors or outdoors. ~~Village or backyard production, with minimal biosecurity and birds or products consumed locally, backyard flocks is not included in this scope even if the broilers or products are traded locally.~~

Broiler production systems include:

1. Broiler production systems include:

1. Completely housed system

Broilers are completely confined in a poultry house, with or without environmental control ~~and often at a higher *stocking density* than in other production systems~~.

Rationale: The definition of a 'Completely Housed System' should be factual, and exclude potentially incorrect inferences that compare one housing system to another.

2. Partially housed system

Broilers are confined in a poultry house but provided with access to a restricted outdoor area.

3. Completely outdoor system

~~At no time during the production period are~~ Broilers are not confined inside a poultry house at any time during the production cycle, but are confined in a designated outdoor area. ~~Broilers are often kept at a lower *stocking density* in these systems than others.~~

Rationale: The definition of a 'Completely Outdoor System' should be factual, and exclude potentially incorrect inferences that compare one housing system to another. Also, this edit is consistent with the language in the 'Scope' for completely and partially housed systems.

This chapter should be read in conjunction with Chapters 7.2., 7.3. and 7.4. on the welfare of the broiler during *transport* to the *slaughterhouse/abattoir*.

~~Article 7.X.3.~~

~~**Commercial Broiler production systems**~~

~~Commercial Broiler production systems include:~~

~~1.~~ ~~Intensive systems~~

~~Broilers are completely confined in a poultry house, with or without environmental control and usually at a higher *stocking density* than in other production systems. Broilers may be kept in cages, with (e.g. wire or plastic floor or deep litter floor) or on litter, or slatted floors or a combination~~

~~2.~~ ~~Semi-intensive systems~~

~~Broilers are confined in a poultry house but provided with access to a restricted outdoor area.~~

~~3.~~ ~~Extensive systems~~

~~Broilers are not confined throughout the production period in a poultry house. and are usually kept at a lower *stocking density*than in intensive or semi intensive systems.~~

Article 7.X.4.

Criteria or measurables for the welfare of broilers

Measurables ~~can~~ should be based on the outcomes for the broiler (outcome based criteria) or the design of the system (resource or design based criteria). Outcome based measurables may give a better indication of welfare than resource based measures because they reflect the complex interaction of several variables (e.g. experience and attitude of handlers and disease situation) that may be overlooked when relying on criteria that focus on the design of the system.

Rationale: This suggested edit is consistent with Chapter 7.1, Article 7.1.2.8.

Some ~~measurables~~ factors of welfare can be measured in the farm setting (e.g. gait, mortality and morbidity rates), while others are best measured at the *slaughterhouse/abattoir*. For example, at slaughter *flocks* can be assessed for presence of bruising, broken limbs and injuries. The age of these lesions can help to determine the source (e.g. catching) (Nicol & Scott, 1990). Back scratching, hock and ~~feet~~ foot ~~burns~~ dermatitis and breast blisters are also easily observed at the *slaughterhouse/abattoir*. Other conditions such as ascites, leg deformities, dehydration and disease conditions can also be assessed at ~~this point~~ slaughter. It is recommended that values for welfare measurables be determined with reference to appropriate national, sectoral or perhaps regional norms for commercial broiler production.

Rationale: Editorial changes for clarity.

The following outcome based measurables are useful indicators of broiler welfare:

1. Mortality (dead, culled) and morbidity

   Daily, weekly and cumulative mortality (dead or culled) and morbidity rates should be within expected ranges. Any unforeseen increase in the daily mortality or morbidity rate could reflect an animal welfare problem and should be promptly investigated.

Rationale: Suggested text for emphasis.

2. Gait

Broilers are susceptible to developing a variety of infectious and non-infectious musculoskeletal disorders (see review in Mench, 2004). ~~If severe~~ These disorders may lead to ~~overt~~ lameness~~, and if less severe~~ to gait abnormalities. Broilers that are lame or have ~~more serious~~ gait abnormalities may have difficulty reaching the food and water, may be trampled by other broilers, and may experience pain. Musculoskeletal problems have many causes, including ~~related to~~ genetics, nutrition, sanitation, lighting, litter quality, and other environmental and management factors (see Mench, 2004; Dawkins et al., 2004). Broilers in commercial flocks should be assessed for gait abnormalities, and corrective actions identified to reduce the incidence of problems in subsequent flocks. There are several gait scoring systems available (Kestin et al., 1992; Garner et al., 2002; Webster et al., 2008; Weeks et al., 2002; Berg and Sanotra, 2003). Regardless of the scoring or assessment system used, broilers that are unable to access feed or water should be ~~humanely~~ euthanized as soon as possible after they have been observed.

3. Contact dermatitis

Contact dermatitis affects skin surfaces ~~which~~ that have prolonged contact with litter or other flooring surfaces~~, including the foot pad, rear surface of the hock and, when severe, the breast area~~. The condition~~s~~ ~~are~~ is manifested as blackened skin progressing to erosions and fibrosis on the lower surface of the foot pad, at the back of the hocks, and sometimes in the breast area. If severe, the foot and hock lesions may contribute to lameness and lead to secondary *infections*. Broilers in commercial flocks should be assessed for contact dermatitis lesions, and corrective actions identified to reduce incidence in subsequent flocks. The Validated s~~S~~coring system~~s~~ for contact dermatitis is an example of a system that has ~~have~~ been developed (see Welfare Quality®, 2009).

Rationale: The use of assessments and corrective actions should be described as is done in the section on "gait".

4. Feather condition

Evaluation of the feather condition of broilers provides useful information about aspects of welfare. Plumage dirtiness ~~and naked area are~~ ~~is~~ may be correlated with both ~~hock~~ ~~burns~~ dermatitis and lameness for individual birds (Arnould and Colin, 2009) or may be associated with the environment and production system. Plumage dirtiness ~~can~~ should be assessed as part of on-farm inspections, ~~when the broilers are caught for *transport* to the *slaughterhouse*/*abattoir* and~~ at the time of harvesting or prior to plucking. A scoring system has been developed for this purpose (RSPCA, 2008).

Rationale: Editorial. Also, outdoor environment and floor type may contribute to plumage dirtiness.

5. Incidence of diseases, metabolic disorders and parasitic infestations

Ill-health, regardless of the cause, is a welfare concern, and may be exacerbated by poor environmental or husbandry management.

~~Ascites, sudden death syndrome and respiratory diseases (including infectious bronchitis, avian pneumovirus *infection* and mycoplasmosis) are of great economic and welfare significance in broilers (SCAHAW, 2000).~~

6. ~~Normal~~ Behaviour

~~Broiler behaviour can be a sensitive indicator of welfare problems.~~

a) Fear behaviour

Fearful broilers show avoidance of humans, and this behaviour is seen in *flocks* where *animal handlers* walk through the poultry house quickly or erratically when performing their tasks rather than moving more slowly while interacting with the broilers (Cransberg et al., 2000) or in situations where animal handlers are not interacting with the broilers frequently enough. Fearfulness (e.g. of sudden loud noises) can also lead to the broilers piling on top of, and even suffocating, one another. Fearful broilers may be less productive (Hemsworth et al., 1994).

b) Spatial distribution

Changes in the spatial distribution (e.g. huddling)of the birds may indicate thermal discomfort ~~(e.g. broilers will huddle when they are cold)~~ or the existence of areas of wet litter or uneven provision of light, food or water ~~(if broilers are unevenly distributed)~~.

c) Panting and wing spreading

Panting and wing spreading ~~may~~ ~~indicates heat~~ may be indicators of stress ~~or high levels of ammonia~~ or high levels of ammonia.

Rationale: Suggest retaining the text as panting may be an indicator of high ammonia levels. (Yahav, 2004.)

d) Dust bathing

Dust bathing is an intricate body maintenance behaviour performed by many birds, including broilers (Olsson and Keeling, 2005). During ~~a~~ dust bathing ~~bout~~, broilers work loose material, such as litter, through their feathers. Dust bathing helps to keep the feathers in good condition, which in turns helps to maintain body temperature and protect against skin injury. Reduced dust bathing behaviour in the flock may indicate problems with litter or range quality, such as litter or ground being ~~that is~~ wet or not friable.

Rationale: Editorial to improve syntax

e) Feeding, drinking and foraging

Reduced feeding or drinking behaviour can indicate management problems, including inadequate feeder or drinker space or placement, dietary imbalance, poor water quality, or feedcontamination. Feeding and drinking behaviour are often depressed when broilers are ill, and ~~feeding is~~ intake may also be reduced during periods of heat stress and increased during cold stress. Foraging is the act of searching for food, typically by walking and pecking or scratching the litter substrate; reduced foraging activity could suggest problems with litter quality or presence of conditions that decrease bird movement (e.g. gait problems).

Rationale: Editorial

f)~~7.~~ ~~Abnormal behaviour~~ Feather pecking and cannibalism

~~Feather pecking is or pulling~~ ~~of the feathers~~ Feather pecking can result in significant feather loss~~,~~ and may lead to cannibalism. Cannibalism is the tearing of the flesh of another bird, and can result in severe injury or~~, and even the~~ death ~~of the pecked broiler~~. These ~~are~~ abnormal behaviours (Mench and Keeling, 2001; Rodenberg and Koene, 2004; Newberry, 2004) have ~~with~~ multi-factorial causes. ~~that are not usually seen in commercial broiler stocks, although they can occur under some circumstances. Feather pecking may sometimes lead to cannibalism or may occur independently; once started, these problems can spread rapidly through the *flock*."~~

7~~8~~. Water and feed consumption

Monitoring daily water consumption ~~can be~~ is a useful tool to indicate disease and other welfare conditions, taking into consideration ambient temperature, relative humidity, feed consumption and other related factors. Problems with the water supply can result in wet litter, diarrhoea, dermatitis or dehydration.

Rationale: Editorial.

Changes in feed consumption can ~~also~~ indicate unsuitability of feed, the presence of disease or ~~and~~ other welfare problems ~~conditions of the *flock* as well as suitability of the feed~~.

8~~9~~. Performance

a) Growth rate - an index that indicates the average daily gain (gr) of weight per average broiler of a flock.

b) Feed conversion - an index that ~~indicates the quantity of feed (kg) that is necessary for a gain of bodyweight of one kilogram of the average broiler of a *flock*~~ measures the quantity of feed consumed by a flock relative to the total liveweight harvested, expressed as a the weight of feed required to produce 1 kg of broiler bodyweight.

c) Liveability - an index that indicates the percentage of broilers present at the end of the production period; more commonly this indicator is measured as its opposite,~~:~~ mortality ~~(see point 1 of Article X.X.4.)~~.

9~~10~~. Injury rate

~~Broilers are susceptible to a number of injuries, and~~ Monitoring the rate of these injuries can indicate welfare problems in the flock during production or ~~capture~~ harvesting. Injuries include those due to other broilers (scratches, feather loss or wounding due to feather pecking and cannibalism) and those due to environmental conditions (e.g. skin lesions) and those due to human intervention, e.g. catching. The most ~~frequent~~ prevalent injuries seen during catching are bruises, broken limbs, dislocated hips, and damaged wings. ~~Fractures are located mainly on femur, radius, ulna, furcula and ischium. Dislocation of the femur at the hip joint is the most prevalent common traumatic injury.~~

Rationale: The edit in the first sentence is more consistent with other text in the document and emphasizes monitoring instead of susceptibility. Deletion of the last sentence is recommended because it is not referenced, does not add to the context of the topic, and may be inaccurate.

10~~1~~. Eye conditions

Conjunctivitis can indicate the presence of irritants such as dust and ammonia. High ammonia levels ~~will~~ can also cause corneal burns and eventual blindness (Morrow 2008:541).

~~11. Vocalisation~~

~~Vocalisation can indicate emotional states, both positive and negative and distress in chickens (Jeon et al., 2005).~~

Rationale: This neither elaborates nor clarifies on an animal welfare issue. Furthermore, it is not setting an international standard for animal welfare.

Article 7.X.5.

Recommendations

1. Biosecurity and animal health

a) Biosecurity and disease prevention

Biosecurity means a set of measures designed to maintain a *flock* at a particular health status and to prevent the entry (or exit) of specific infectious agents.

~~Biosecurity programmes should be implemented, commensurate with the risk of disease and in accordance with relevant recommendations found in Terrestrial Code chapters on OIE listed diseases.~~

Biosecurity programmes should be designed and implemented, commensurate with the desired flock health status and current disease risk (endemic and exotic or transboundary) that is specific to each epidemiological group of broilers and in accordance with relevant recommendations

Rationale: Duplicative to the information in the paragraph right above this box.

found in *Terrestrial Code* chapters on OIE listed diseases.

These programmes should address the control of the major routes for disease and pathogen transmission:

a) direct transmission from other *poultry*, domesticated and wild animals and humans,

b) fomites, such as equipment, facilities and *vehicles*,

c) vectors (e.g., arthropods),

d) aerosols,

e) water supply,

f) feed.

Outcome based measurables: incidence of diseases, metabolic disorders and parasitic infestations~~,~~; mortality; ~~and~~ performance.

b) Animal health management, ~~/~~ preventive medicine and~~/~~ veterinary treatment

Animal health management means a system designed to optimise the health and welfare of the broilers. It includes prevention, treatment and control of *diseases* and adverse conditions.

Those responsible for the care of broilers should be aware of the signs of ill-health or distress, such as a change in feed and water intake, reduced growth, changes in behaviour, abnormal appearance of feathers, faeces, or other physical features.

If persons in charge are not able to identify the causes of disease, ~~of~~ ill-health or distress, or to correct these, or if they suspect the presence of a ~~listed~~ reportable disease, they should seek advice from ~~those having training and experience, such as~~ poultry *veterinarians* or other qualified advisers. Veterinary treatments should be prescribed by a ~~qualified~~ *veterinarian*.

There should be an effective programme for the prevention and treatment of *diseases* consistent with the programmes established by the *Veterinary Services* as appropriate.

Vaccinations and ~~other~~ ~~administered~~ treatments should be administered ~~undertaken~~ ~~with consideration of the welfare of the~~ ~~broilers~~ by ~~qualified~~ personnel skilled in the procedures and with consideration for the welfare of the broilers.

Sick or injured broilers should be ~~culled humanely~~ euthanized as soon as possible. Similarly, ~~killing~~ euthanizing broilers for diagnostic purposes should be done ~~in a humane manner~~ according to Chapter 7.6. ~~of the *Terrestrial Code*~~.

Rationale: Culling means removal or selection. Euthanasia is the more appropriate term. 'Humanely' is not needed as a descriptor, because euthanasia is humane by definition.

Outcome based measurables: incidence of diseases, metabolic disorders and parasitic infestations~~,~~; mortality; ~~and~~ performance; lameness; and physical appearance.

Rationale: Lamenes and physical appearance, such as soiled feathers, can be used as measures of welfare.

2. Environment and management

a) Thermal environment

Thermal conditions for broilers should be appropriate for their stage of development, and extremes of heat, humidity and cold should be avoided. For the growing stage the Thermal Heat Index (THI) can assist in identifying the comfort zones for the broilers at varying temperature and relative humidity levels.

When environmental conditions move outside these zones, various strategies can be used in different production systems to mitigate the adverse effects on the broilers: e.g. high air speeds and evaporative cooling and reducing stocking density can alleviate the effects of high heat and humidity ~~in intensive systems~~.

~~Ventilation should aim at controlling relative humidity to prevent the development of wet litter. Assessing litter condition on a regular basis is recommended.~~

Rationale: Adjusting air speeds and stocking densities can alleviate heat and humidity regardless of the system used. Ventilation information is more appropriate under Article 7.X.5.2.C., Air Quality.

Management ~~system~~ of the thermal environment should be checked ~~at least twice a day~~ frequently enough so that failure of the systems maintaining the thermal environment would be noticed before it caused a welfare issue.

Rationale: Standards should be outcome, not design, based.

Outcome based measurables: ~~normal and abnormal~~ behaviour~~;~~, mortality~~;~~ contact dermatitis~~;~~ water and feed consumption, performance, ~~feather condition~~ physical appearance.

Rationale: Feather condition is just one example of physical appearance that might indicate a welfare issue.

b) Lighting

There should be ~~an adequate~~ at least one period of continuous darkness during each 24 hour period to allow the broilers to rest. There should also be a~~n adequate~~ period of continuous light. Darkness is defined as a light intensity at least fifty percent lower than the light intensity during the continuous light period. Reference should be made to relevant national, regional or international recommendations.

Rationale: The use of terms such as "adequate" is not helpful in setting international standards. Outcome-based standards are needed. A basis of understanding and agreement between what constitutes darkness is needed.

The light intensity during the light period should be sufficient and homogeneously distributed to allow the broilers to find feed and water in the first few days after they are placed in the poultry house, to stimulate activity, and allow adequate inspection.

There should be a period for gradual adjustment ~~Broilers should be gradually adjusted~~ to lighting changes.

Outcome based measurables: gait~~;~~ metabolic disorders~~;~~ performance~~;~~ ~~normal and abnormal~~ behaviour~~;~~ ~~eye condition~~ and injury rate.

Rationale: Performance in and of itself is not necessarily either a good or bad welfare indicator. The same is true for the remaining Articles within this proposed chapter in which this edit has been added. However, performance changes may indicate a disease challenge, a result of a natural disaster, mechanical failure, and/or a welfare concern that should be investigated.

c) Air quality

General comment: Becasue of the similarities to section a) 'thermal environment', the OIE might consider either merging sections a) and c) or change the order to a) thermal environment, b) air quality, c) lighting.

~~Adequate v~~Ventilation is required at all times to provide fresh air. Ventilation should aim at providing fresh air, removing noxious gases (carbon dioxide, ammonia, etc.) and controlling ambient temperature and relative humidity inside the housing system. The goal of ventilation is to prevent sub-optimal environment (excessive litter moisture, high levels of dust or noxious gases, etc.) for the broilers.

Rationale: Inserted from Article 7.X.5.2.a., Thermal environment.

Ammonia concentration should not routinely exceed 25 ppm at broiler level (Kristensen and Wathes, 2000; Jones et al., 2005).

Dust levels should be kept to a minimum. ~~Methods for doing so that can include maintaining appropriate ventilation and satisfactory litter moisture levels.~~ Where the health and welfare of broilers depends on an artificial ventilation system, provision should be made for an appropriate back-up power and alarm system.

Rationale: Deleting this sentence recommended because it is already covered above in the newly added paragraph.

Outcome based measurables: incidence of respiratory diseases;~~,~~ metabolic disorders;~~,~~ ~~and parasitic infestations (respiratory diseases), behaviour (panting, huddling).~~ eye conditions;~~,~~ performance;~~,~~ contact dermatitis ~~and spatial distribution of the birds~~.

d) Noise

Exposure of broilers to sudden or loud noises should be minimised where possible to prevent stress and fear reactions (e.g. piling).

Location of farms should, where possible, take into account existing local sources of noise.

Outcome based measurables: daily mortality rate, morbidity;~~,~~ ~~performance;~~,~~ injury rate;~~,~~ ~~and~~ fear behaviour.

Rationale: Loud or sudden noises will be most evident by looking at the daily mortality rate, injury rate and behavior. Sudden or loud noises can result in fearful reactions of the flock and increased stress for the birds which could cause piling, and in turn injury and/or death due to suffocation.

e) Nutrition

Broilers should always be fed a diet appropriate to their age and genetics, which contains adequate nutrients to meet their requirements for growth and good health.

Feed and water should be palatable and ~~free from~~ not contain contaminants ~~potentially~~ at levels hazardous to broiler health.

The water system should be cleaned regularly to prevent growth of hazardous microorganisms.

Rationale: Editorial comment. Freedom from contaminants was edited to make this standard practically applicable.

Broilers should be provided with adequate access to feed on a daily basis. Water should be available continuously.

~~Special p~~ Provisions (e.g. height of equipment, distribution, location, etc.) should be made to enable ~~young chicks~~ broilers ~~to~~ access to ~~appropriate~~ feed and water with minimal risk of injury or stress. This is especially important for young chicks.

Rationale: Editorial suggestions for improved clarity.

Outcome based measurables: feed and water consumption~~;~~, performance~~;~~, ~~normal and abnormal~~ behaviour~~;~~, gait~~;~~, incidence of diseases~~;~~, metabolic disorders and parasitic infestations~~;~~, mortality~~;~~ ~~and~~ injury rate.

f) Flooring, bedding, resting surfaces and ~~(~~litter quality~~)~~

The floor of a poultry house should ~~preferably~~ be easy to clean and disinfect.

Rationale: Use of the word "preferably" provides no clear guidance. The United States also advises the OIE to reconsider this standard in light of the fact that in some countries dirt floors covered with litter is a common practice for raising broilers; therefore, disinfecting dirt floors is neither possible nor practical.

The provision of loose and dry material is desirable in order to encourage dust bathing and foraging.

Litter should be managed to minimise any detrimental effects on welfare and health. Poor litter quality can lead to foot pad dermatitis, hock burns and breast blisters. Litter should be replaced or adequately treated when required to ~~control~~ prevent ~~a~~ *disease* ~~*outbreak*~~ in the next *flock*.

~~Litter quality is partly related to the type of substrate used and partly to different management practices. The type of substrate should be chosen carefully.~~

Rationale: The United States recommends delecting these two sentences because they add little substance to the Chapter or discussion.

Litter should be maintained so that it is dry and friable and not dusty, caked or wet and limits the potential for injury or irritation for the broilers. Factors to be considered in litter management include: type of substrate, quality (including absorptive quality), availability of substrate, and depth of litter.

Rationale: Editorial suggestions for better guidance.

Slatted floors~~, often used where a very humid climate precludes the use of other flooring substrates,~~ should be designed, constructed and maintained to adequately support the broilers, prevent injuries and ~~to~~ ensure that manure can fall through or be adequately removed.

Rationale: This appears to be an editorial statement by the writer and adds no real value. The OIE may want to consider deleting this paragraph since the term slatted floor was removed from Article 7.X.1.

To prevent injury, day-old birds should be placed on an appropriate type of flooring suitable for their size ~~to prevent injury.~~

If housed on litter ~~based systems~~, before day-old birds enter the poultry house, the floor should have a bedding of ~~uncontaminated~~ clean substrate (e.g. wood shavings, straw, rice husk, shredded paper, treated used litter) of sufficient depth to elicit normal behaviour and to separate ~~protect~~ them from the floor or previously used bedding.

Rationale: "Uncontaminated" infers a pathogen-free status. "Clean" infers a substrate previously unused by production animals, which we believe is the intent of the sentence. A complete cleanout of the broiler houses between flocks is not standard industry practice, and is not economically feasible.

Outcome based measurables: contact dermatitis;~~,~~ feather condition;~~,~~ metabolic disorders;~~,~~ gait;~~,~~ behaviour (dust bathing and foraging);~~,~~ eye conditions;~~,~~ incidence of diseases;~~,~~ metabolic disorders and parasitic infestations;~~,~~ ~~(respiratory disease)~~ ~~and~~ changes in performance.

g) Prevention of feather pecking and cannibalism ~~Social environment~~

Management methods, such as ~~(e.g.~~ reducing light intensity, providing foraging materials, nutritional modifications, reducing stocking density, selecting the appropriate genetic stock~~)~~ should be implemented ~~to reduce feather pecking and cannibalism in growing systems~~ where ~~these behaviours~~ feather pecking and cannibalism are a potential problem.

If these management strategies fail, therapeutic beak trimming ~~should be considered as~~ is the last ~~option~~ resort ~~and after a thorough investigation~~.

Outcome based measurables: injury rate;~~,~~ ~~normal and abnormal~~ behaviour;~~,~~ feather condition;~~,~~ ~~and~~ mortality.

h) Stocking density

~~Broilers should be housed in at an appropriate stocking density~~.

Rationale: The use of the term "appropriate" provides no helpful guidance. Outcome-based standards are needed.

To determine ~~the appropriate stocking density so that the floor space provided will ensure good welfare (comfort, ability to express normal postural adjustment and to access feed and water),~~ the amount of floor space that needs to be provided per bird ~~in order for the~~ so that broilers ~~to~~ can access feed and water, ~~and~~ adjust their posture normally and engage in locomotor activity important to fitness, the following factors should be taken into account: management capabilities, ambient conditions, housing system~~s~~, production~~s~~ system~~s~~, litter quality, ventilation, biosecurity strategy, genetic stock~~s~~, and market age and weight ~~of broilers~~.

Outcome based measurables: injury rate;~~,~~ contact dermatitis;~~,~~ respiratory problems, mortality;~~,~~ ~~normal and abnormal~~ behaviour;~~,~~ level of activity and movement gait;~~,~~ incidence of diseases;~~,~~ metabolic disorders and parasitic infestations;~~,~~

Rationale: A review of the scientific literature shows that stocking density is central to broiler welfare (Bessei 2006), and the literature clearly supports that the ability to move (i.e., exercise) is important to maintain skeletal strength. In addition, the need to move extends beyond movement within a particular space. The ability to move from one spot to another is critical for access to food and water, to escape aggression, etc. A bird may be able to walk, but may also be socially excluded from feed in badly designed or overstocked systems.

At high densities, pathologies (chronic dermatitis, leg disorders) are increased and walking ability and general activity are reduced (Hall 2001). This reduced activity contributes to leg weakness in broilers, especially in fast growing breeds. Scientific research shows that gait tends to be poorer at higher densities.

High stocking densities can lead to reduced air quality which does impact respiratory health (e.g., heat stress, ammonia, dust). Thus measurables such as ammonia levels, dust particulates, etc may be important parameters for determining respiratory health.

Bessei W., 2006. Welfare of broilers: a review. World's Poultry Science Journal. Vol 62, September 2006: 455-466.

Hall A., 2001. The effect of stocking density on the welfare and behaviour of broiler chickens reared commercially. Animal Welfare **10,** 23-40

Sanotra G. S Lawson L. G. and Vestergaard K. S., 2001. Influence of stocking density on tonic immobility, lameness and tibial dyschondroplasia in broilers. Journal of Applied Animal Welfare Science **4(1):** 71-87.

i) Outdoor areas

Broilers can be given access to outdoor areas as soon as they are old enough to range safely. There should be sufficient exit areas to allow them ~~broilers~~ to enter and leave the poultry house freely.

Management of outdoor areas is important in ~~extensive and semi-intensive~~ partially housed and completely outdoor production systems. Land and ~~(~~pasture~~)~~ management measures should be taken to reduce the risk of broilers being infected by pathogens or infested by parasites. This might include limiting the stocking density ~~and /~~ or using several pieces of land consecutively in ~~(~~rotation~~)~~.

Outdoor areas should be managed appropriately to minimise swampy conditions and mud. Outdoor areas should ~~preferably~~ be placed on well drained ground.

Rationale: Use of the word "preferably" is not recommended as it does not provide clear guidance.

Outdoor areas should be managed appropriately to ensure that they are free from ~~of~~ poisonous plants and ~~other~~ contaminants.

~~Particularly in extensive systems where birds~~ broilers ~~do not have access to an indoor area,~~ Protection from adverse climatic conditions ~~(e.g. heat, cold, rain)~~ should be provided in completely outdoor systems.

Outcome based measurables: ~~normal and abnormal~~ behaviour;~~,~~ incidence of parasitic infestations;~~,~~ performance;~~,~~ contact dermatitis;~~,~~ feather condition;~~,~~ mortality;~~,~~ ~~rate~~ ~~and~~ morbidity.

j) Protection from predators

Broilers should be protected from predators.

Outcome based measurables: fear behaviour;~~,~~ mortality; missing mortality~~,~~ ~~and~~ injury rate.

Rationale: Missing mortality = stocking number – recorded mortality – ending population)

k) Genetic selection

Welfare and health considerations, in addition to productivity, should be taken into account when choosing a strain for a particular location or production system.

Outcome based measurables: gait;~~,~~ metabolic disorders;~~,~~ mortality;~~, normal and abnormal~~ behaviour;~~,~~ contact dermatitis, ~~and~~ performance.

Rationale: EFSA Panel on Animal Health and Welfare (AHAW): Scientific Opinion on the influence of genetic parameters on the welfare and the resistance to stress of commercial broilers. EFSA Journal 2010; 8 (7):1666. [82 pp.]. doi:10.2903/j.efsa.2010.1666.

l) Painful interventions

Painful interventions, such as~~(e.g.~~ beak trimming, toe trimming, dubbing~~)~~ should not be routinely practised on broilers.

If therapeutic beak trimming is required, it should be carried out by trained and skilled personnel at as early an age as possible and care should be taken to remove the minimum amount of beak necessary using a method which minimises pain and controls bleeding (Glatz and Miao, 2005; Hester and Shea-Moore, 2003).

Surgical caponisation should not be performed without adequate pain and *infection* control methods and should only be performed by *veterinarians* or trained and skilled personnel under veterinary supervision.

Outcome based measurables: ~~use of any of the above procedures.~~

Rationale: "Use of any of the above procedures" is not consistent with other parts of this chapter. Examples of outcome-based criteria include mortality and morbidity, physical condition, behaviour, water and feed consumption, feather pecking , etc.

m) Handling and inspection

~~Broilers should be inspected at least twice a day~~ Inspection should have three main objectives: ~~1)~~ to identify sick or injured broilers to treat or cull them;~~,~~ ~~2)~~ to detect and correct any welfare or health problem in the *flock* ~~(e.g. related to the supply of feed and water, thermal conditions, ventilation, litter quality)~~;~~,~~ and ~~3)~~ to pick up dead broilers.

Rationale: Requiring that broilers be inspected at least twice a day is prescriptive and is not outcome or performance based.

Inspection should be done in such a way that broilers are not unnecessarily disturbed, for example *animal handlers* should move quietly and slowly through the *flock*.

When broilers are handled they should not be injured or unnecessarily frightened or stressed.

Broilers which have an incurable illness ~~sickness~~, significant deformity or injury should be

removed from the *flock* and ~~humanely~~ ~~killed humanely~~ euthanized as soon as possible as described in Chapter 7.6.

Cervical dislocation is an acceptable method for ~~killing~~ euthanizing small numbers of broilers if carried out competently as described in ~~(see~~ Article 7.6.17. ~~of the *Terrestrial Code*)~~. ~~For a complete description of killing methods see Article 7.6.175. of the *Terrestrial Code*.~~

Outcome based measurables: ~~normal and abnormal~~ behaviour~~,~~; performance~~,~~; injury rate~~,~~; mortality~~,~~; vocalisation; ~~and~~ morbidity.

Rationale: Editorial suggestions.

n) Personnel training

All people responsible for the broilers should receive ~~appropriate~~ training so that they are competent to carry out their responsibilities and should have sufficient knowledge of broiler behaviour, handling techniques, ~~emergency~~ euthanasia procedures, biosecurity, general signs of disease, and indicators of ~~poor *animal welfare* such as~~ behaviour that may indicate stress, illness or ~~and~~ pain, and ~~their alleviation~~ management procedures to enhance the health and welfare outcomes of the broilers in their care.

Rationale: Edits provided for clarity and better guidance.

Outcome based measurables: all measurables could apply.

o) Emergency plans

Broiler producers should have emergency plans to minimise and mitigate the consequences of natural disasters, *disease* outbreaks and the failure of mechanical equipment. Planning may include the provision of fail-safe alarm devices to detect malfunctions, back-up generators, access to maintenance providers, alternative heating or cooling arrangements, ability to store water on farm, access to water cartage services, adequate on farm storage of feed and alternative feed supply and a plan for managing ~~emergency~~ ventilation emergencies.

Rationale: Editorial suggestions.

An emergency plan for animal health should be developed consistent with national programs established or recommended by *Veterinary Services* as appropriate.

p) Location, construction and equipment of farms

The location of ~~poultry~~ broiler farms should be chosen to be safe from the effects of fires and floods and other natural disasters to the extent practical. In addition farms should be sited to avoid or minimise biosecurity risks, exposure of ~~birds~~ broilers to chemical and physical contaminants, noise and adverse climatic conditions.

~~Poultry~~ Broiler houses, outdoor areas and equipment to which broilers have access should be designed and maintained to avoid injury or pain to the ~~birds~~ broilers.

~~Poultry~~ Broiler houses should be constructed and electrical and fuel installations should be fitted to minimise the risk of fire and other hazards.

Broiler producers should have a maintenance programme in place for all equipment ~~that, in case of~~ the failure of which can jeopardise broiler welfare.

q) On farm harvesting

~~Broilers should not be subject to an excessive period of feed withdrawal prior to the expected *slaughter* time.~~

Rationale: Suggest deleting the text unless an outcome based criteria is provided for the term "excessive".

Water should be available up to the time of harvesting ~~catching~~.

Broilers that are not fit for loading or *transport* because they are sick or injured should be ~~killed humanely~~ euthanized ~~(e.g. severely injured or severely ill) should be culled or separated prior to harvesting the *flock*~~.

Catching should be carried out by skilled *animal handlers* and every attempt should be made to minimise stress and fear reactions, and injury. If a broiler is injured during catching it should be ~~culled killed humanely~~ euthanized.

Broilers should not be picked up or carried by their head, tail, neck or wings.

Rationale: Editorial to improve clarity.

Broilers should be carefully placed in the *transport container*.

Mechanical catchers, where used, should be designed, operated and maintained to minimise injury, stress and fear to the broilers. A contingency plan is advisable in case of mechanical failure.

Catching should preferably be carried out under dim or blue light to calm the broilers.

Catching should be scheduled to minimise the time to *slaughter* as well as climatic stress during catching, *transport* and holding.

Stocking density in *transport containers* should suit climatic conditions and maintain comfort.

Containers should be designed and maintained to avoid injury, and they should be cleaned and if necessary, disinfected, regularly ~~clean and disinfected and designed and maintained to avoid injury to the broilers birds~~.

Outcome based measurables: injury rate; ~~and~~ mortality rate ~~(~~at harvesting ~~catching~~ and ~~dead~~ on arrival at the *slaughterhouse/abattoir*~~)~~.

r) Environmental enrichment (future proposed section?)

Rationale: Peer-reviewed scientific studies exist supporting the value that environmental enrichments make to animal welfare. As this chapter is further defined in the future, the OIE (considering the appropriate scientific data and the appropriate economic feasibility) may want to consider adding a specific article on environmental enrichment.

~~2.18.Humane killing~~

~~Injured and sick birds should be killed humanely.~~

~~Cervical dislocation is considered a humane method for killing small numbers of broilers birds (see Article 7.6.17. of the *Terrestrial Code*).~~

~~For a description of other methods for the humane killing of broilers see Article 7.6.5. of the *Terrestrial Code*.~~

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